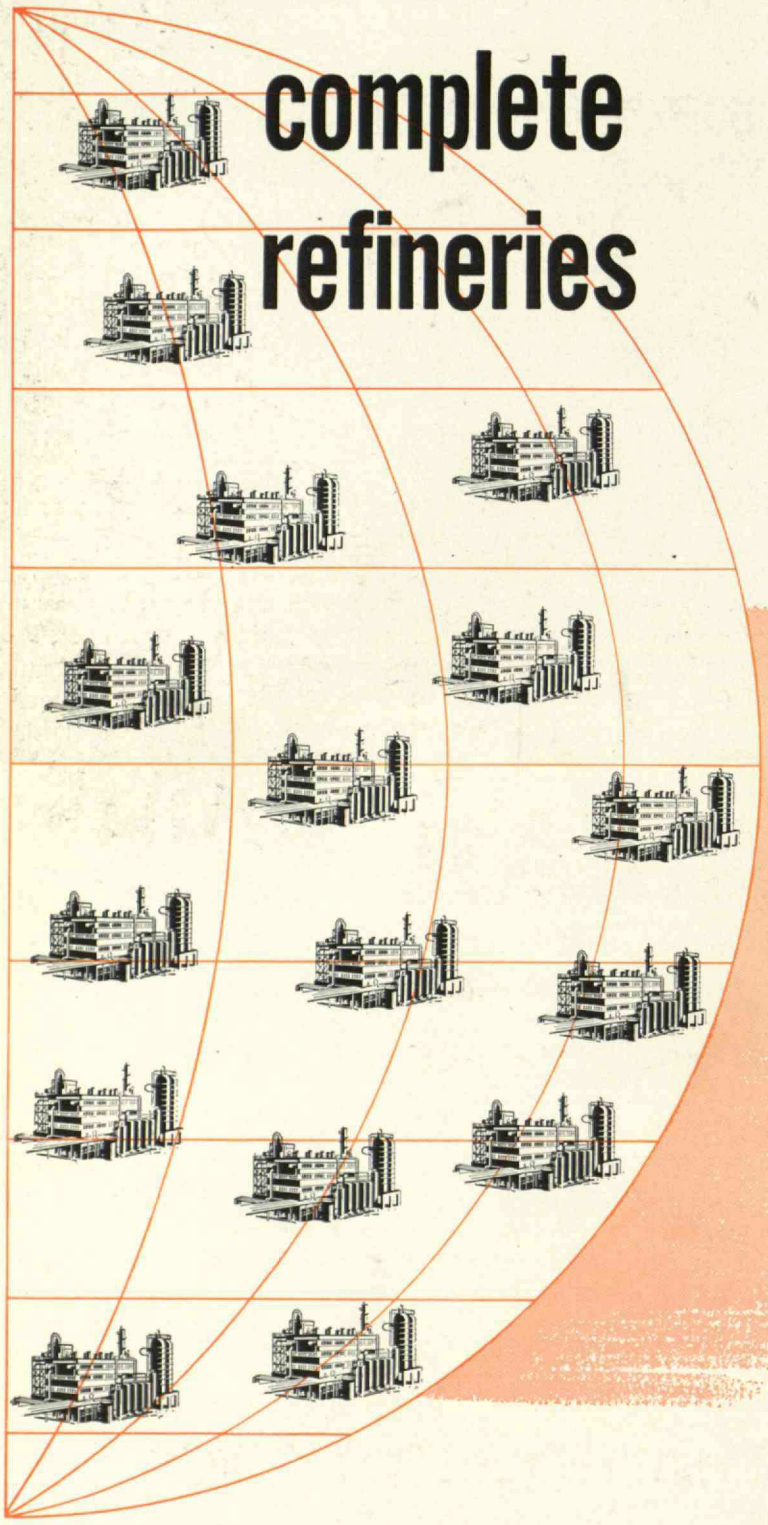
TECHNOLOGY REVIEW

February 1956

16 complete refineries



1945

1. Refinery for B. P. M. at Cardon, Venezuela.
2. Refinery for Koppartrans Oljeaktiebolag at Gothenburg, Sweden.
3. Refinery for Venezuela Gulf Refining Company at Puerto La Cruz, Venezuela.
4. Refinery for Societe Generale des Huiles de Petrole at Dunkirk, France.
5. "Portable" refinery for U. S. Navy Department.
6. Lube oil refinery for Cit-Con Oil Corporation at Lake Charles, Louisiana.
7. Refinery for International Refineries Inc. at Wrenshall, Minnesota.
8. Refinery for Vacuum Oil Company Ltd. at Coryton, England.
9. Refinery for Burmah-Shell Oil Company at Bombay, India.
10. Refinery for Standard-Vacuum Oil Company at Bombay, India.
11. Refinery for Standard Oil Company (Indiana) at Mandan, North Dakota.
12. Refinery for Suntide Refining Company at Corpus Christi, Texas.
13. Refinery for Commonwealth Refining Company at Ponce, Puerto Rico.
14. Refinery for Esso Standard Oil Company at Antwerp, Belgium.
15. Refinery for Caltex at Visakhapatnam, India.
16. Refinery for Neste Oy at Turku, Finland.

1955

In the past 10 years alone, Lummus has completed or is currently working on 16 complete refineries. Combined, they represent a large percentage of the refinery capacity constructed in the last decade.

But complete refineries are only part of the Lummus story. Separate units for any and all phases of refining from distillation to petrochemical production have been designed, engineered and built by Lummus – as additions to existing installations or as integral parts of new construction.

In the past 50 years, Lummus has added over 700 petroleum and chemical plants and installations to the world's total. Think of Lummus when planning your next project.

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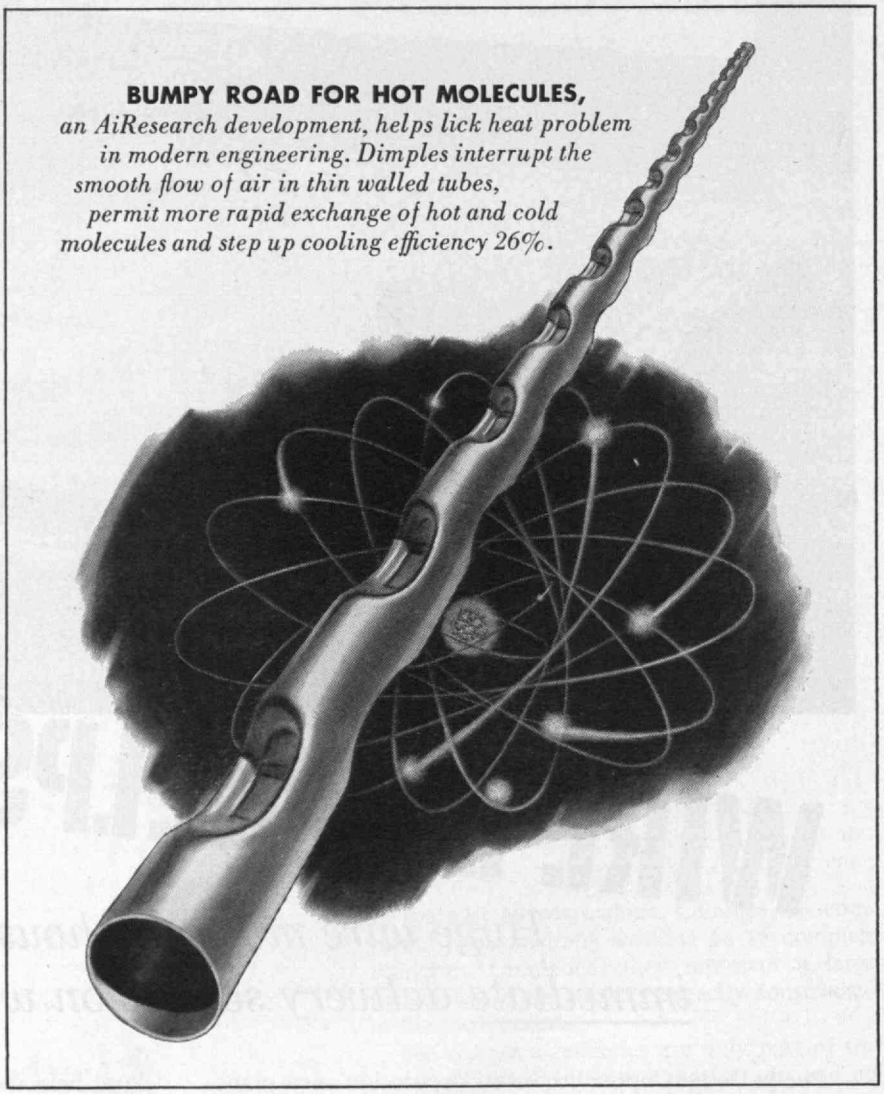
To the engineer who likes to blaze new trails...



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AiResearch is a key company in the industrial future of America. We are playing a vital part in the great engineering advances now taking place.

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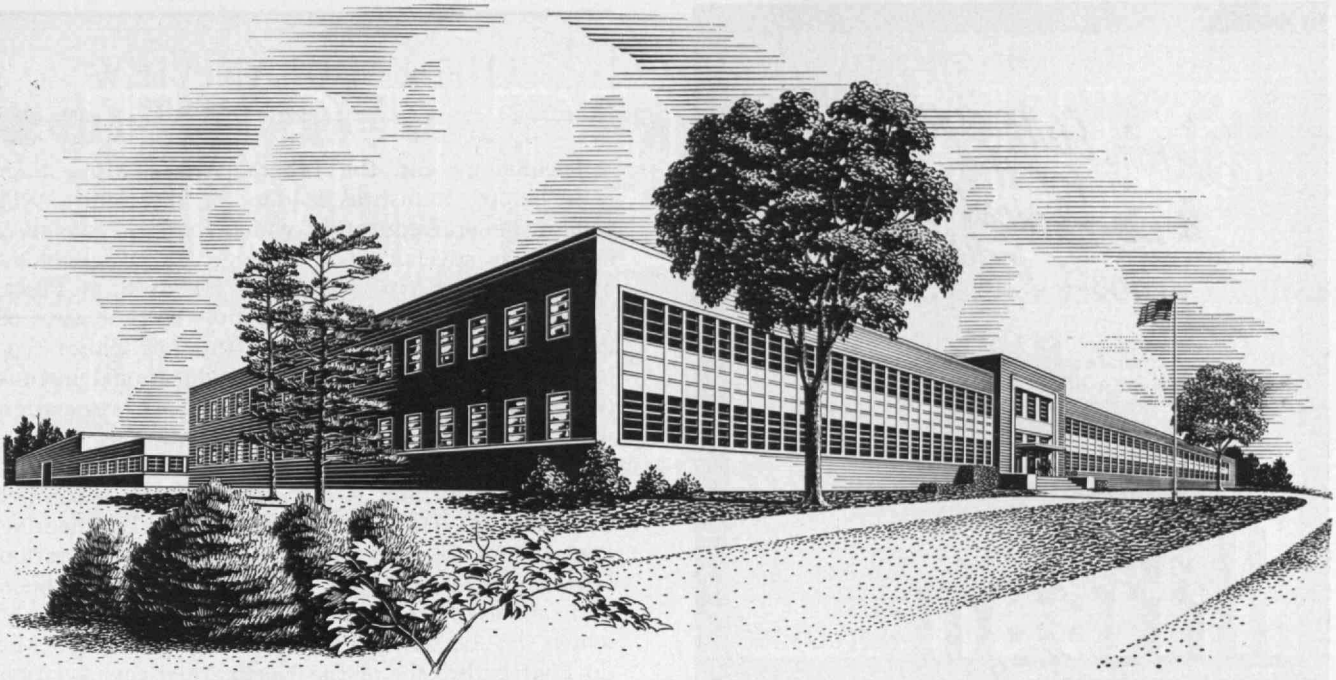

COMBUSTION ENGINEERING now building

NUCLEAR ENGINEERING AND DEVELOPMENT CENTER

On a 530-acre site in Windsor, Connecticut, Combustion Engineering is now building a Nuclear Engineering and Development Center. In addition to the Engineering and Administration Building, shown above, there will be a critical experiment facility for studying the physics and nuclear characteristics of reactor cores, a "hot" laboratory and a fuel element fabrication plant, together with related metallurgical, chemical and physical testing laboratories.

This multi-million dollar project, for which Stone & Webster Engineering Corporation are the architects and engineers, is scheduled for initial operation late this year and completion in early '57. In conjunction with new nuclear facilities recently placed in operation at the Company's Chattanooga, Tenn., plant, the Windsor plant will enable Combustion

to design, develop and manufacture complete nuclear power reactor systems

Heavy components such as reactor vessels, boilers, plugs and shields will be manufactured at Chattanooga. Reactor cores, including fuel elements and control rods, will be produced at Windsor.

The new nuclear building at Chattanooga includes such equipment as a 15,000,000-volt betatron for fast X-raying of thick plate and welds; large precision machine tools capable of handling work up to 20 feet in diameter with accuracies comparable to those required in watchmaking; and cranes to handle loads in excess of 300 tons. A new dock is equipped to handle reactor vessels too large and heavy for rail or highway shipment. By virtue of these facilities, Combustion becomes the *first company in the world* to possess equipment especially designed for the manufacture of heavy reactor components and to be able to ship them by water to virtually all river and coastal ports.

The panel at the right reveals the Company's current activity in the nuclear field. With the new facilities now available or in process, and others recently authorized, Combustion is prepared to achieve the same position of leadership in nuclear power that it has long occupied in the field of conventional power generation.

C-E NUCLEAR WORK 1955-56

Contract to design, develop and build complete nuclear reactor system for a submarine. *(This contract made Combustion the country's third major contractor to AEC on the naval reactor development program, and the first to undertake such a contract with its own facilities.)*

Contract to design and build major reactor components for U.S.S. Seawolf.

Contract to design and build major reactor components for large naval surface ship.

Contract to design and build major reactor components for Submarine Advanced Reactor and Submarine Fleet Reactor Systems.

Contract to design and build major reactor components for Shippingport plant to be operated by Duquesne Light Company. *(This will be country's first commercial size nuclear power plant.)*

Contract to design and build major reactor components for Atomic Power Development Associates. *(This fast breeder reactor, to be operated by Detroit Edison Company, is regarded as the most advanced type projected to date for a commercial size power installation.)*

Agreement with AEC for design and evaluation studies of both large and small reactors and of fuel elements and their fabrication.

COMBUSTION ENGINEERING

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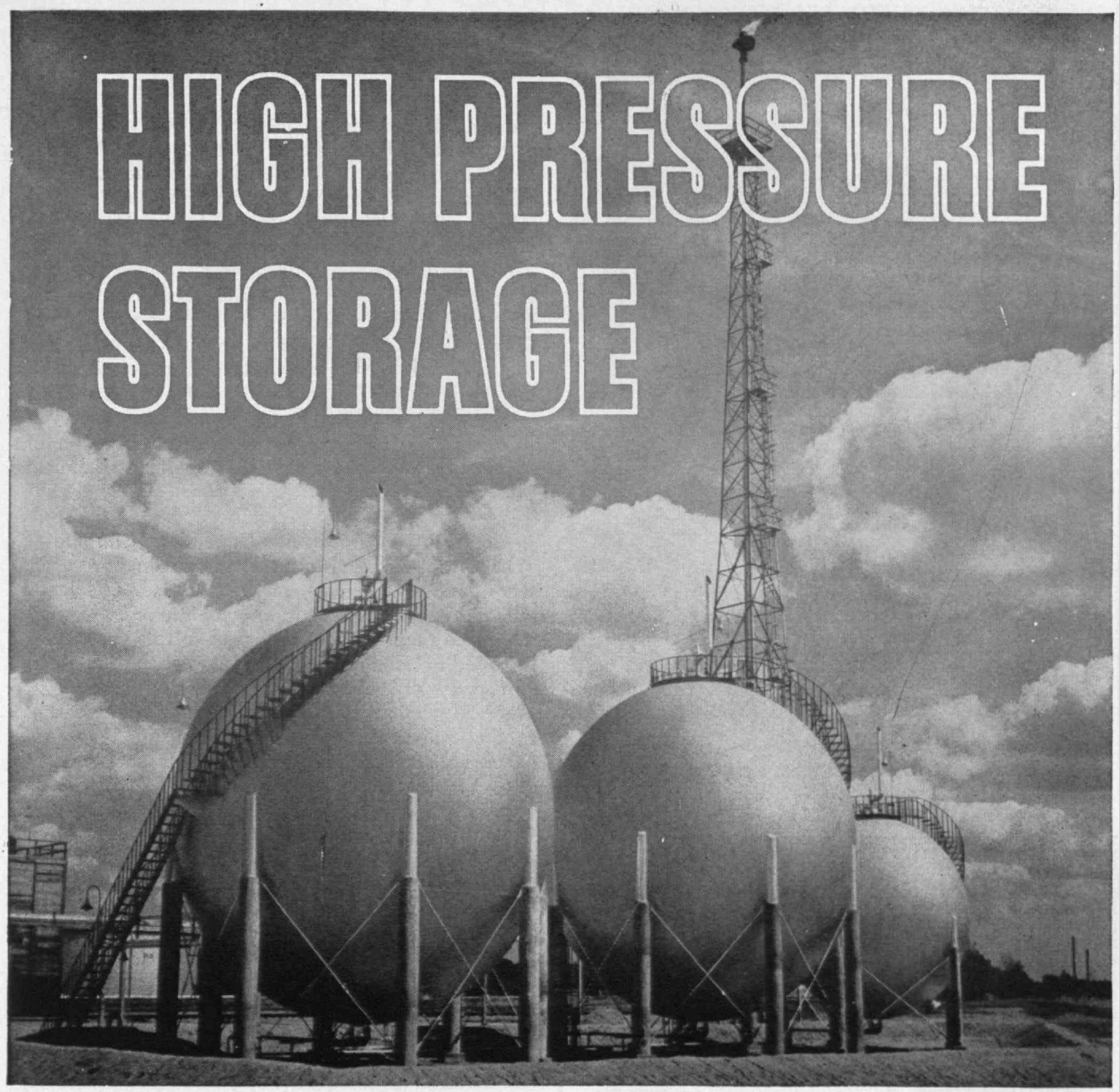
STEAM GENERATING UNITS; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; DOMESTIC WATER HEATERS; SOIL PIPE

THE TABULAR VIEW

Technology and the Liberal Arts. — More than ever before, industrial leaders of the future will require general education which lends perspective, as well as specialized knowledge. In "Technology and the Liberal Arts" (page 187) HENRY B. DU PONT, '23, writes convincingly that one of the best ways of developing future leaders is through closer cooperation between industry and educational institutions. Mr. du Pont's long and intimate association with industrial and educational institutions lends a special force to his message. Mr. du Pont studied at Yale University and is a member of the Institute's Class of 1923. He was employed in the Engineering Department of the General Motors Corporation between 1924 and 1927, and since 1927 has been with the E. I. du Pont de Nemours Company of which he became a vice-president in 1939. Mr. du Pont is director of the North American Aviation Company, Wilmington Trust Company, and General Motors Corporation. He is president of the Alexis I. du Pont School in Wilmington.

Dollars from Wastes. — Growth of the nation's population, expansion of its urban sections, limited useful agricultural areas, and increasing demands for products made from dwindling natural re-

(*Concluded on page 178*)



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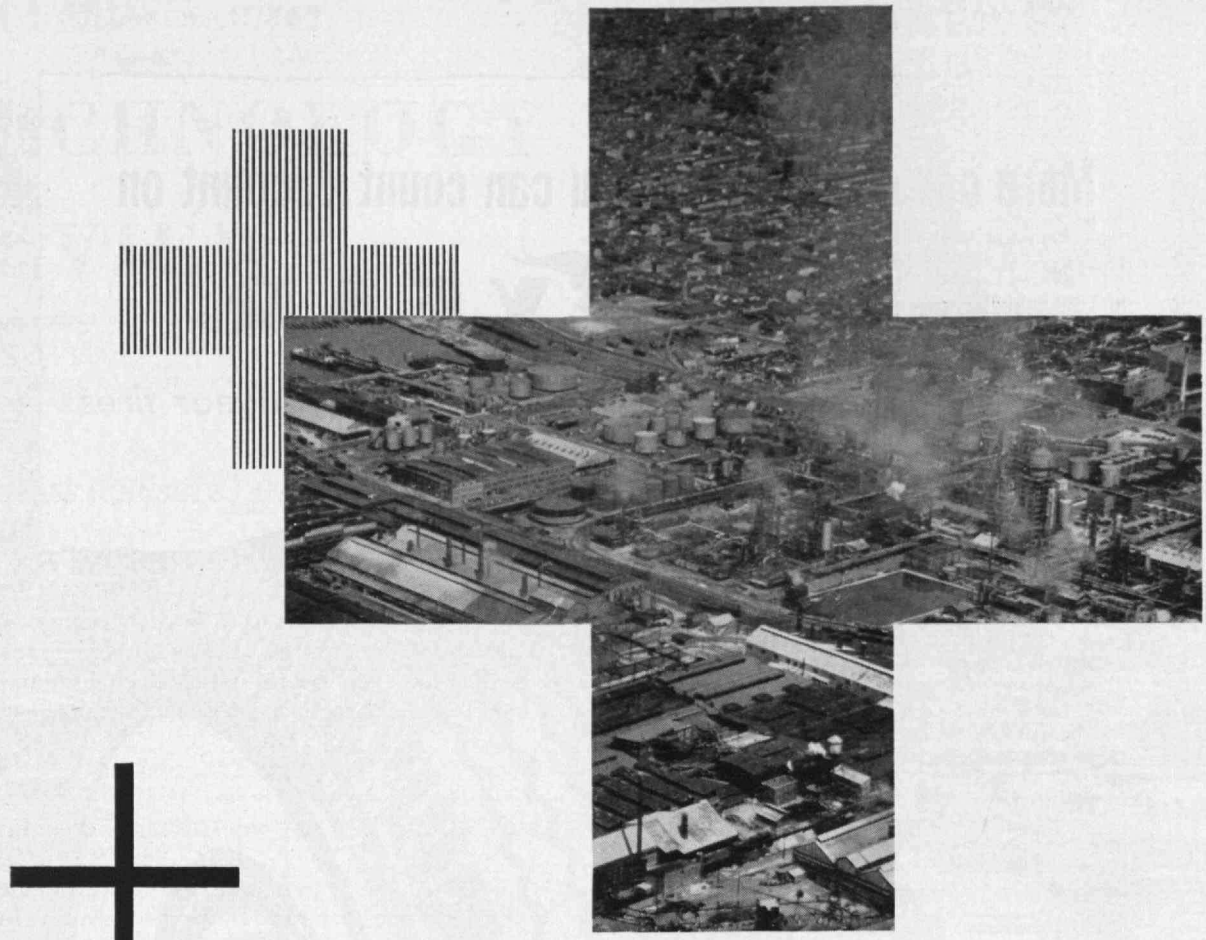
GRAVER builds tanks, towers and pressure vessels for the chemical and petroleum industries

THE TABULAR VIEW

(Concluded from page 176)

sources, all combine to pose a serious problem of conservation. One means of meeting expanding raw material requirements is to make more effective and efficient use of food and agricultural wastes, and "Dollars from Wastes" (page 191) by HARRY W. VON LOESECKE, urges the adoption of such a program. After graduation from Harvard University, Mr. von Loesecke became research chemist for the General Electric Company, the American Protein Corporation, and the United Fruit Company. He has also been senior chemist, industrial specialist, and technical adviser in a variety of projects related to agriculture and the food industry. Mr. von Loesecke is a fellow of the American Public Health Association, and member of the American Chemical Society.

American Engineering Education Abroad. — What problems confront the engineering professor who applies American methods in foreign lands where textbooks and laboratory facilities are less commonplace than here? One answer to this problem is provided in "Engineering Education at the American University of Beirut" (page 194) by EDWARD S. HOPE, '26 who has been professor of civil engineering in that university since 1951. Professor Hope received the B.A. degree from Morehouse College in 1923, the S.B. and S.M. degrees from M.I.T. in 1926 and 1927, respectively, and the Ed.D. degree from Columbia University in 1942. Following graduation from M.I.T., Dr. Hope spent a year as highway engineer for the State of New York, three years as hydraulic engineer in Rio de Janeiro, Brazil, and 12 years as superintendent of Buildings and Grounds, at Howard University. During his term in the Navy, between 1944 and1946, he became director of instruction, C.E.C. Navy Pacific University with rank of Lieutenant Commander.



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